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GENERAL BIOLOGY.

Filose Activity in Metazoan Eggs. — Any new facts that throw light upon the complicated problem of the relations to one another of the cells in an organism are exceedingly welcome. We note with pleasure, therefore, an article[1] by Prof. E. A. Andrews, giving a summary of his researches upon the formation of pseudopodia-like processes in metazoan eggs, to which Mrs. Andrews first clearly called attention in 1897.[2]

The filose processes are described as extremely fine protoplasmic threads arising from the surface of blastomeres in various stages of cleavage. They traverse the blastocœl, and frequently become attached to other blastomeres or to the polar bodies, which also give rise to similar processes. The threads may branch, and the protoplasm flowing along them may collect in nodules, especially at the points of origin of the branches.

These filose phenomena were observed in living eggs of a nudibranch mollusk, *Tergipes despectus* (?); a lamellibranch, *Yoldia limatula;* a nemertean, *Cerebratulus lacteus* Verrill; an annelid, Serpula; and echinoderms.

Among the Chordata, preserved material only was available. In sections of cleavage and larval stages of the salamander *Amblystoma punctatum*, and in certain frog's eggs, undoubted protoplasmic connections between the cells were observed, but their normal filose character was not certain. Eggs of Amphioxus in four, eight, and sixteen-cell stages showed marked intercellular connections. In the illustrations these are seen to be filaments of considerable length, extending across the cleavage cavity. Figures of the filose processes found in living and in preserved echinoderm eggs are introduced for comparison, and support the view that the filaments in the egg of Amphioxus are of the same character.

If the filose phenomena are as widely distributed throughout the animal kingdom as this paper would lead one to suppose, they will become surely an important factor in future theories of ontogeny.

R. P. B.

A Plea for the Theory of Special Creation. — While the methods of evolution still furnish matter for discussion, one might suppose that, for scientific people at least, the central fact of organic evolution had been established beyond question. In opposition to this view, we have a book of nearly 400 pages, by Prof. Alfred Fairhurst,[1] who has been "for many years a teacher of various branches of natural science." We doubt, however, whether his arguments will be found convincing by many who have paid very much attention to the biological sciences. The object of the book is "to promote the belief in Theism and in the existence of a spiritual nature in man which Theism alone can explain." Therefore, the author attacks evolution, not because Theism and the doctrine of evolution are necessarily antagonistic, — the author does not think that they are, — but because the belief in Theism in some people has been decreased by the propagation of the theory of evolution.

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[1] Andrews, E. A. Filose Activity in Metazoan Eggs, *Zoological Bulletin*, vol. ii (July, 1898), No. 1, pp. 1–13.

[2] *Journ. of Morph.*, vol. xii, No. 2.

The difficulties that the author arrays against evolution are the old familiar ones: the origin of living material, the survival of primitive types, divergent evolution, absence of "missing links," the appearance of highly organized forms in early fossiliferous rocks, uselessness of nascent organs, instinct, and the like. He does not attach much weight to the evidence from homologies and vestigeal organs. For example, "they (fins) are said to be homologous to the limbs of higher vertebrates, but I regard the homology as farfetched." Again, "embryo man with gill arches is still man, and if we can read the lesson within it, we will find that this embryo man points upward to adult man with all of his marvelous powers of mind, and not downward to something infinitely below him."

To properly answer arguments presented from the point of view of this book, one would have to preface his remarks by a treatise on elementary biology, comparative anatomy, and embryology, and introduce a chapter on the natural history of animals and plants, with remarks on fossilization. The limits of a review will hardly permit this.

R. P. B.

Fusion of Pupæ. — In the Woods Holl Lectures for 1896 and 1897,[2] Henry E. Crampton, Jr., gives an interesting account of his experiments upon the pupæ of Lepidoptera. By cutting away portions of two pupæ, and joining the cut surfaces, he was able in many

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[1] Fairhurst, Alfred. *Organic Evolution Considered.* St. Louis, Christian Pub. Co., 1897. 8vo., 386 pp.

[2] Crampton, Henry E., Jr. Coalescence Experiments upon the Lepidoptera, *Biological Lectures delivered at the Marine Biological Laboratory of Woods Holl.* Boston, Ginn & Company, 1898. pp. 219–228.